ABSTRACT OF THE DISCLOSURE

A method for tracking the movement and position of mobile agents using light detection and ranging (LIDAR) as a stand-off optical detection technique. The positions of the agents are tracked by analyzing the time-history of a series of optical measurements made over the field of view of the optical system. This provides a (time + 3-D) or (time+2-D) mapping of the location of the mobile agents. Repeated pulses of a laser beam impinge on a mobile agent, such as a bee, and are backscattered from the agent into a LIDAR detection system. Alternatively, the incident laser pulses excite fluorescence or phosphorescence from the agent, which is detected using a LIDAR system. Analysis of the spatial location of signals from the agents produced by repeated pulses generates a multidimensional map of agent location.